



A human development framework for CO₂ reductions

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Abstract:

Although developing countries are called to participate in CO₂ emission reduction efforts to avoid dangerous climate change, the implications of proposed reduction schemes in human development standards of developing countries remain a matter of debate. We show the existence of a positive and time-dependent correlation between the Human Development Index (HDI) and per capita CO₂ emissions from fossil fuel combustion. Employing this empirical relation, extrapolating the HDI, and using three population scenarios, the cumulative CO₂ emissions necessary for developing countries to achieve particular HDI thresholds are assessed following a Development As Usual approach (DAU). If current demographic and development trends are maintained, we estimate that by 2050 around 85% of the world's population will live in countries with high HDI (above 0.8). In particular, 300 Gt of cumulative CO₂ emissions between 2000 and 2050 are estimated to be necessary for the development of 104 developing countries in the year 2000. This value represents between 20 % to 30 % of previously calculated CO₂ budgets limiting global warming to 2 degrees C. These constraints and results are incorporated into a CO₂ reduction framework involving four domains of climate action for individual countries. The framework reserves a fair emission path for developing countries to proceed with their development by indexing country-dependent reduction rates proportional to the HDI in order to preserve the 2 degrees C target after a particular development threshold is reached. For example, in each time step of five years, countries with an HDI of 0.85 would need to reduce their per capita emissions by approx. 17% and countries with an HDI of 0.9 by 33 %. Under this approach, global cumulative emissions by 2050 are estimated to range from 850 up to 1100 Gt of CO₂. These values are within the uncertainty range of emissions to limit global temperatures to 2 degrees C.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3244443>

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Unspecified Exposure

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified



Climate Change and Human Health Literature Portal

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Mitigation

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Other Projection Model/Methodology

Other Projection Model/Methodology: future CO2 emissions as a function of population growth and "human development index" (a summary measure of each country's achievement of living standards, health/longevity, and access to knowledge/education)

Resource Type:

format or standard characteristic of resource

Policy/Opinion, Research Article

Socioeconomic Scenario: Other Socioeconomic Scenario

Other Socioeconomic Scenario: projected population growth, and varying thresholds of the human development index

Timescale:

time period studied

Long-Term (>50 years)